The Role of Software Implementation in Enhancing Business Operations of Msmes in Cebu's Tri-Cities

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ABSTRACT

This study focuses on the role of implementing software solutions in enhancing the business operations of Micro, Small, and Medium Enterprises (MSMEs) in the Tri-Cities of Cebu.

It examined the level of software implementation, user adoption, and influence on operational efficiency and financial management practices, uncovered the barriers encountered before, during, and after software implementation, and examined the relationship between software system implementation and operational efficiency. This study used a mixed-method research design with 382 respondents, who comprised business owners, decision-makers, and managers. The quantitative data were analyzed using descriptive statistics, such as average and frequency, and Pearson's correlation, and thematic analysis was used for the qualitative responses.

The results showed that MSMEs in the Tri-Cities of Cebu agreed that software systems are being implemented in their daily operations. This revealed a very strong positive relationship between software system implementation and operational efficiency, with a Pearson correlation coefficient of $r = 0.854$ and a p-value of <0.001. The higher level of software system implementation, the higher the level of operational efficiency. Despite these benefits, businesses may still face challenges, where the most significant barrier identified was cost-related issues.

Implementing a software system plays a crucial role in improving and sustaining the business operations of MSMEs. Software systems help the business by processing transactions faster, improving workflows, reducing manual errors, and strengthening the financial management practices.

However, the success of the implementation depends on the readiness of the organization, proper planning, enough financial resources, sufficient employee training, and support of the management. Based on the findings of the study, the researcher developed a Software Implementation Adoption Manual to assist MSMEs in the Tri-Cities of Cebu with a guide in planning and implementing software systems in their day-to-day business operations.

Keywords: software implementation, MSMEs, Tri-Cities of Cebu, operational efficiency

INTRODUCTION

Interconnectivity, software automation, and cloud computing are expanding rapidly in the years ahead. Therefore, the market in this type of industry is large and is also projected to expand further in the coming years. A clear example of this is the adoption of artificial intelligence (AI). Because of the COVID-19 pandemic, 76% of business executives under the information and technology industries have shifted to adopt automation into their day-to-day operations (Lund et al., 2020). In order for us to better understand the overall effects of automation, it is important that we support our judgement with data. Based on the data provided by the Philippine Statistics Authority, in 2024, 1,846,900 out of 1,852,403, or 99.70%, of businesses operating in

the country fell under the category of MSMEs. Because they comprise almost all of the businesses in the Philippines, we could say that MSMEs can be considered the backbone of our economy, which can have a significant impact on national growth and development. Based on PSA's records, there are 112,965 businesses in the entirety of Cebu, and 67,318, or 59.87%, of these are categorized as MSMEs. Although some businesses have already embedded software systems into their daily operations, others still rely on the traditional way of doing business. However, it is not yet clear how far companies have integrated software systems into their day-to-day operations, what challenges or barriers they encounter before, during, and after implementation, and how these software systems help them achieve operational efficiency and financial management. Integrating software systems supports businesses by improving the efficiency and productivity of their operations. These software systems can also provide instant information regarding sales, engagement from customers, accounting, and financial reports. On the other hand, although most large enterprises rapidly adopted these technologies, many MSMEs encounter challenges in adapting due to limited resources and cost limitations.

MSMEs' operational efficiency and financial management will be affected if they rely purely on the manual process way of doing business. In a traditional business setup, the process of generating operational and financial reports requires a lot of manual work, is prone to human errors, and takes a lot of time to complete. These are some of the reasons that cause delays in the decision-making process of business owners. Since MSMEs usually have a limited budget to hire additional personnel, it often takes them approximately two to three days (2-3) to complete a financial report. The recording of accounting transactions has to be done accurately because even minor mistakes can result in significant consequences. Historically, writing numbers in ledger books is done traditionally by hand. As these are time-consuming and prone to mistakes, it slows down the speed of creating and analyzing financial reports (Beryl Odonkor et al., 2024). Manual methods reduce the speed of processes, increase the likelihood of human errors, and weaken the accuracy of financial information. Because of these factors, MSMEs in the Tri-Cities of Cebu seek to assess the implications of implementing software systems for operational efficiency and financial management.

There are studies that show the significance of using software systems in business operations. It displays how it can add value and help improve the overall operational efficiency by streamlining the business process, minimizing human errors, enhancing inter-department coordination, and enhancing its financial management through more accurate records, improved budgeting and reporting, and cost control. In having a successful and effective implementation, there are several factors that were identified, such as organizational readiness, employee skills, management support, and appropriate software selection. At the same time, there are several common barriers that were also identified, such as technical challenges, cost-related issues, resistance of employees, and compatibility problems.

Available studies generally focus on large enterprises and provide an overview of digitalization from an overall perspective; however, limited attention is given to MSMEs in the Tri-Cities of Cebu. There is still a lack of evidence-based data on how MSMEs in the Tri-Cities of Cebu implement software solutions into their day-to-day operations, to what extent they face technical, financial, and organizational challenges, and how these affect their overall efficiency and financial management. Very limited studies also provide a practical output, such as manual for implementing software system that is tailored for MSMEs in this local context.

To address the identified gaps, the study seeks to (1) describe the profile of MSMEs in terms of business classification, location, type of industry, years in operations, number of employees, and position of respondents; (2) establish the extent of implementing software solutions in terms of level of implementation, user adoption, training, and integration; (3) identify the operational challenges in terms of technical challenges, cost issues, user resistance, and compatibility problems; (4) discuss how software solutions can affect their operational efficiency in terms of speed of processes, error reduction, and workflow management; and (5) discuss how software solutions can affect their financial management practices in terms of financial records, budgeting, reporting, and cost control. Based on these findings, this study not only supports academic literature but also offers MSME owners in the Tri-Cities of Cebu a software system adoption manual that may be used as a guide in planning and implementing software solutions.

To frame out the analysis, this study is guided by the Technology Acceptance Model (TAM) by Davis (1989, as cited in Saleh et al., 2022), the Technology-Organization-Environment (TOE) framework of Tornatzky and

Fleischer (1990, as cited in Guzman & Sudaria, 2025), and the DeLone and McLean Information Systems Success model (DeLone & McLean, 1992, 2003). These three (3) theories explain that the success of implementing software systems among MSMEs depends on the perception of users, the readiness of the organization, and the quality of the chosen system. Different legal frameworks and policies under Philippine law also support MSME software adoption, such as the Magna Carta for MSMEs (RA 6977, RA 8289, and RA 9501), the E-Commerce Act (RA 8792), and the Data Privacy Act of 2012 (RA 10173).

METHODOLOGY

Research Design

This study used a mixed-methods research design, integrating both quantitative and qualitative approaches to examine the influence of software implementation on the business operations of MSMEs in Cebu's Tri-Cities (Cebu City, Mandaue City, and Lapu-Lapu City) for the fiscal year 2024, with respondents consisting of managers, business owners, or decision-makers. For the qualitative part, a purposive sampling method was used to further examine the responses through open-ended questions and interview guide questions. Because of this approach, it provided the researcher a more profound understanding of the decisions of the key respondents in adapting software systems. A stratified random sampling technique was utilized for the quantitative part, and questionnaires were measured with rating scales in terms of software implementation, operational challenges and efficiency, and financial management of MSMEs. To balance the result, businesses within the Tri-Cities of Cebu were classified according to their size (micro, small, or medium).

Research Environment and Respondents

The study was conducted within the Tri-Cities of Cebu, namely Cebu City, Mandaue City, and Lapu-Lapu City. The researcher chose these three cities as the study area because they are regarded as highly urbanized cities within the larger Metro Cebu and are recognized as independent administratively from the provincial government. Cebu City is considered the primary center for commerce, Mandaue City is an industrial city, and Lapu-Lapu City is an area for manufacturing and resorts. The Philippine Statistics Authority (PSA) recorded in 2024 a total of 112,965 businesses in the entire Province of Cebu. Cebu has a total registered business of 112,965. 112,439 of these fall under the categories of MSMEs, of which 59.87%, or 67,318, of these are located within the Tri-Cities of Cebu. In terms of employment, the Tri-Cities of Cebu employ a total of 726,342 employees, or 76.69%, compared to the total employment of 947,091 in all of Cebu. These ratios show the big contribution of MSMEs in the entire economy of Cebu Province.

The respondents chosen by the researcher were the companies categorized as Micro, Small, and Medium Enterprises (MSMEs) located within the Tri-Cities of Cebu, namely, Cebu City, Mandaue City, and Lapu-Lapu City. All necessary data that were used in this research in terms of level of software implementation, operational efficiency, financial management, and operational challenges of MSMEs were gathered from managers, decision-makers, or owners. In 2024, there were 67,318 businesses that were recorded by the PSA that were categorized as MSMEs within the Tri-Cities of Cebu. The breakdown is as follows: Cebu City - 38,430; Mandaue City - 14,300; and Lapu-Lapu City - 14,588. The researcher utilized Cochran's formula, where a sample size of 382 was determined, with a 5% margin of error. Respondents were proportionally divided to ensure a balanced representation, where Cebu City had 218 and Mandaue City and Lapu-Lapu City had 81 and 83, respectively. In addition, a stratified random sampling method was utilized to ensure that the different business classifications (micro, small, and medium) were represented accordingly. After gathering the data, the researcher used descriptive statistics (average and frequency) and inferential statistics for the Pearson's correlation in analyzing the responses. For the qualitative part, a purposive sampling method was used to supply in-depth insights into their experiences and decision-making processes. The responses of the selected respondents were analyzed using thematic analysis. Because the researcher used a combination of different methods, this gave the researcher an advantage to explore deeply the specific cases of how software systems influence the business operations of MSMEs in the Tri-Cities of Cebu.

Research Instrument

The researcher utilized two (2) research instruments for this study, namely an interview guide questionnaire for the qualitative method and a structured questionnaire for the quantitative method. With respect to the qualitative part, selected respondents were given an open-ended question. It was designed to provide the researcher with a more profound understanding of the key respondents' decisions pertaining to their experiences, motivations, and challenges related to software implementation in their business operations. For the qualitative component of the study, the researcher used a thematic analysis to support the respondents' responses pertaining to the proposed adoption manual.

For the quantitative component, a structured questionnaire was utilized to measure the respondents' experiences with software implementation, operational efficiency, financial management, and operational challenges of MSMEs in the Tri-Cities of Cebu. The questionnaire was composed of multiple sections, such as (1) the profile of the business (business classification, location, type of industry, years in operation, and number of employees); (2) the level of MSMEs in implementing software solutions in terms of the level of implementation and user adoption; (3) the operational efficiency of MSMEs operations in terms of speed of processes, error reduction, and workflow improvement; and (4) the outcome of financial management practices in terms of accuracy of financial records, budgeting, reporting, and cost control. (5) operational challenges encountered during and after software implementation in terms of technical challenges, user issues and resistance, and compatibility problems;

In addition, the researcher used a five-point Likert scale, where 5 represents the highest rating (Strongly Agree / Extremely High Barrier) and 1 represents the lowest (Strongly Disagree / No Barrier). Descriptive statistics, such as average, frequency, and standard deviation, were utilized to treat the data, and inferential statistics for Pearson's correlation. To guarantee the significance and clarity, both questionnaires were reviewed and verified by a subject-matter expert prior to the actual data collection.

Gathering of Data

The researcher gathered two sets of data, that is, the primary and secondary data. The responses from managers, decision-makers, or owners were considered as the primary information, and the respondents were selected using a purposive sampling technique, as this would form part of the qualitative part. For the quantitative portion, the researcher selected the respondents using stratified random sampling and utilized Google Forms as a medium for the questionnaires. To examine the data in terms of software implementation, operational efficiency, financial management, and operational challenges of MSMEs, a five-point Likert scale was used by the researcher. For the qualitative part, the researcher used Google Forms to collect data and gather deeper insights into the decision-making perceptions of key respondents. To ensure the questionnaire's relevance to the study, the research adviser reviewed and validated the questionnaires prior to the actual data collection. Preliminary testing was performed to ensure that the data collected through the chosen platform worked accurately and reliably prior to the actual data collection. The secondary data were collected from the existing official records available from the Philippine Statistics Authority (PSA). Agencies were given a formal request letter to obtain the secondary data needed for this research. All data gathering adhered to the highest ethical standards and was conducted voluntarily, with the full consent of the respondents. All information gathered was kept sensitive and used solely for academic purposes.

Statistical Treatment of Data

The data collected from the respondents was checked for accuracy, completeness, and relevance according to the study, where the respondents were grouped according to their business locations (Cebu City, Mandaue City, or Lapu-Lapu City). The researcher also organized the results by removing and consolidating redundant responses.

To describe and analyze the profile of respondents, such as business classification (micro, small, or medium), location of the business, type of industry, number of years in operation, and the number of employees, descriptive statistical methods were utilized, such as frequency and averages. Mean and standard deviation

were used to analyze the level of software implementation, its operational efficiencies, financial management practices, and operational challenges. An inferential statistic, such as Pearson's correlation, was used to analyze if there was a relationship between the software implementation and operational efficiency.

The responses for the open-ended questions were summarized, categorized, and analyzed through thematic analysis to support the findings towards the proposed adoption manual in implementing software solutions to the business operations.

RESULTS AND DISCUSSION

Profile of MSMEs

Table 5. BUSINESS CLASSIFICATION OF A BUSINESS

	Frequency	Percent	Cumulative Percent
Micro	143	37.43%	37.43%
Small	197	51.57%	89.01%
Medium	42	10.99%	100.00%
Total	**382**	**100.00%**	

The data in Table No. 5 reveals that 51.57 percent of the businesses in the Tri-Cities of Cebu belong to the classification of small enterprises. This indicates that small enterprises constituted the largest group of respondents in the study. This also reflects the perspective and experiences of small enterprises regarding the implementation of software systems in their business operations. According to Kallmuenzer et al. (2025) software systems were regarded as helpful tools that enable the organization to market its products and services to its customers effectively, as well as boost the overall performance of the organization.

Table 6. LOCATION OF A BUSINESS

	Frequency	Percent	Cumulative Percent
Cebu City	218	57.07%	57.07%
Mandaue City	81	21.20%	78.27%
Lapu-Lapu City	83	21.73%	100.00%
Total	**382**	**100.00%**	

The data in Table No. 6 reveals that 57.07 percent of the businesses in the study are located in Cebu City. This indicates that Cebu City is considered one of the primary business hubs of Cebu, generating a significant level of business activity and contributing to supporting the development of the local economy. The stability and

overall financial health of an organization are not only for the benefit of the company but also for the overall economic impact of which they operate (Ocan et al., 2025).

Table 7. TYPE OF INDUSTRY

	Frequency	Percent	Cumulative Percent
Accommodation and Food Service Activities	42	10.99%	10.99%
Administrative and Support Services	26	6.81%	17.80%
Agriculture, Forestry, and Fishing	9	2.36%	20.16%
Arts, Entertainment, and Recreation	8	2.09%	22.25%
Construction	21	5.50%	27.75%
Education	23	6.02%	33.77%
Electricity, Gas, Steam & Air Conditioning Supply	6	1.57%	35.34%
Financial and Insurance Activities	8	2.09%	37.43%
Human Health and Social Work Activities	19	4.97%	42.41%
Information and Communication	32	8.38%	50.79%
Manufacturing	22	5.76%	56.54%
Mining and Quarrying	0	0.00%	56.54%
Other Service Activities	41	10.73%	67.28%
Professional, Scientific, and Technical Activities	22	5.76%	73.04%
Real Estate Activities	13	3.40%	76.44%
Transport and Storage	24	6.28%	82.72%
Water Supply, Waste Management, and Remediation Activities	5	1.31%	84.03%
Wholesale & Retail Trade; Repair of Motor Vehicles and Motorcycles	61	15.97%	100.00%
Total	**382**	**100.00%**	

The data in Table No. 7 reveals that the top three industries in which businesses in the Tri-Cities of Cebu operate are wholesale & retail trade: repair of motor vehicles and motorcycles; accommodation and food service activities; and other service activities. When these three industries are combined, they account for 37.69 percent of the total businesses, representing more than one-third of all businesses in the Tri-Cities of Cebu. Because they constitute a significant portion of the business community, helping these businesses improve their operations through software implementation could benefit many businesses and contribute to a more efficient local economy. According to Leogrande (2025), wholesale and retail industries contributed significantly to the overall gross domestic product, employment rate, and investment of the local and national economy.

Table 8. YEARS IN OPERATION

	Frequency	Percent	Cumulative Percent
1 - 5 Years	194	50.79%	50.79%
6 - 10 Years	127	33.25%	84.03%
11 - 15 Years	40	10.47%	94.50%
16 - 20 Years	13	3.40%	97.91%
Above 20 Years	8	2.09%	100.00%
Total	**382**	**100.00%**	

The data in Table No. 8 reveals that 84.04 percent of the businesses have been operating for one to ten years. This indicates that the majority of the businesses are still in their early to growth stages. As a result, these companies are more likely to focus on improving their operations and increasing efficiency, making software implementation relevant to support their growth. By leveraging technologies, it helps by enhancing the operational efficiency of an organization (Martínez-Peláez et al., 2023).

Table 9. NUMBER OF EMPLOYEES

	Frequency	Percent	Cumulative Percent
1 - 9 Employees	143	37.43%	37.43%
10 - 99 Employees	197	51.57%	89.01%
100 - 199 Employees	42	10.99%	100.00%
Total	**382**	**100.00%**	

The data in Table No. 9 reveals that 51.57 percent of the businesses employ between 10 and 99 employees. This suggests that the majority of the businesses have enough workforce that needs better coordination,

communication, and management. This also suggests that as the number of employees increases, manual processes have become more difficult to manage. Salam (2022) mentioned that effective internal control can lead to multiple advantages within the workforce, which can help improve the company's profitability.

Level of Software Implementation

Table 10. LEVEL OF IMPLEMENTATION

	5 (Strongly Agree)	4 (Agree)	3 (Neither Agree nor Disagree)	2 (Disagree)	1 (Strongly Disagree)	Weighted Mean	Interpretation
Software is used across major operational areas (sales, purchasing, inventory, and accounting)	156	177	37	8	4	4.24	**Strongly Agree**
Most daily transactions are processed through the software.	151	169	47	9	6	4.18	**Agree**
Departments regularly use the system in their operations.	155	134	76	12	5	4.10	**Agree**
System-generated data is used for analysis and planning.	126	174	69	9	4	4.07	**Agree**
Critical business decisions rely on system-generated reports.	154	143	72	8	5	4.13	**Agree**
Overall Mean						**4.14**	**Agree**

The data in Table No. 10 shows the responses on the level of software system implementation in the daily operations of businesses. The data reveals that the overall mean is 4.14, interpreted as "Agree", indicating that the respondents generally affirm that software systems are being implemented in their daily operations. This means that software systems are being used as part of their regular business process, such as encoding of sales transactions, purchasing, and inventory. However, although software systems are already used for their daily operations, companies have not fully utilized the data collected for planning, forecasting, and analysis. The data also suggests that there is still room for improvement in maximizing the system-generated data for business analysis. The study of Martínez-Peláez et al. (2023) discusses MSMEs aligning their organizational plans and strategies by utilizing the data collected from software systems, which provides valuable insights about customer behavior.

Table 11. USER ADOPTION

	5 (Strongly Agree)	4 (Agree)	3 (Neither Agree nor Disagree)	2 (Disagree)	1 (Strongly Disagree)	Weighted Mean	Interpretation
Most employees use the software as part of their daily tasks.	126	184	56	12	4	4.09	**Agree**
Employees show willingness to learn and use digital tools.	177	137	63	5	0	4.27	**Strongly Agree**

Employees rarely revert to manual processes.	144	167	76	20	5	4.35	**Strongly Agree**
Management encourages employees to adopt digital tools.	159	164	52	6	1	4.24	**Strongly Agree**
Employees show interest in the success of the implemented software.	176	123	73	7	3	4.21	**Strongly Agree**
Overall Mean						**4.23**	**Strongly Agree**

The data in Table No. 11 shows the responses on user adoption. The data reveals that the overall mean is 4.23, interpreted as "Strongly Agree," indicating that the respondents strongly affirm that employees or users are adopting software systems in performing their daily tasks. The highest weighted mean of 4.35 is "Employees rarely revert to manual processes." This indicates that once employees begin to use the system and recognize how it improves their work, they are unlikely to return to manual processes. Because of it, it suggests that they have developed confidence in the system that they are using and most likely prefer using it over a manual process. Businesses usually encounter different concerns, such as high waiting times due to the manual processing of information (Di Sutam et al., 2024). This concern highlights the importance of user satisfaction because when users are satisfied with their using experience, they are more likely to appreciate the system more and may continue using it consistently.

Operational Efficiency

Table 12. SPEED OF PROCESSES

	5 (Strongly Agree)	**4 (Agree)**	**3 (Neither Agree nor Disagree)**	**2 (Disagree)**	**1 (Strongly Disagree)**	**Weighted Mean**	**Interpretation**
Daily transactions are completed faster through the system.	152	176	51	1	2	4.24	**Strongly Agree**
Reports (e.g., sales) are generated more quickly.	160	159	57	4	2	4.23	**Strongly Agree**
Retrieval of customer/supplier information is faster.	177	133	62	8	2	4.24	**Strongly Agree**
Overall Mean						**4.24**	**Strongly Agree**

The data in Table No. 12 shows the operational efficiency of an organization in terms of speed of processes. The data reveals that the overall mean is 4.24, interpreted as "Strongly Agree," indicating that the respondents strongly affirm that using software systems helps improve the speed of business processes. The data also suggests that software systems allow the users to process and gather information more quickly. The current lead time to complete the material management process of a manufacturing industry is two hundred forty-three minutes, but after implementing an enterprise resource planning system, it was reduced to forty minutes (Oliverio et al., 2023).

Table 13. ERROR REDUCTION

	5 (Strongly Agree)	4 (Agree)	3 (Neither Agree nor Disagree)	2 (Disagree)	1 (Strongly Disagree)	Weighted Mean	Interpretation
Errors in encoding and processing are reduced.	107	184	84	3	4	4.01	**Agree**
System minimizes inconsistencies in records.	126	188	59	5	4	4.12	**Agree**
Automated processes reduce human errors.	126	184	67	4	1	4.13	**Agree**
Overall Mean						**4.09**	**Agree**

The data in Table No. 13 shows the operational efficiency of an organization in terms of error reduction. The data reveals that the overall mean is 4.09, interpreted as "Agree," indicating that the respondents generally affirm that using software systems helps reduce errors that occur during transactions. Although the results reveal that implementing software systems contributes to operational efficiency, there is still room for improvement, such as providing proper user training and ensuring correct encoding of transactions to further reduce errors and maximize the full potential of automation. An Accounting Information System (AIS) is a safeguard tool that prevents or reduces errors in encoding because of incompetent employees (Salam, 2022).

Table 14. WORKFLOW IMPROVEMENT

	5 (Strongly Agree)	4 (Agree)	3 (Neither Agree nor Disagree)	2 (Disagree)	1 (Strongly Disagree)	Weighted Mean	Interpretation
Workflows are more organized due to system use.	180	136	61	3	2	4.28	**Strongly Agree**
Tasks are completed efficiently because processes are streamlined.	131	189	51	7	4	4.14	**Agree**
Coordination among departments has improved.	168	159	45	8	2	4.26	**Strongly Agree**
Overall Mean						**4.23**	**Strongly Agree**

The data in Table No. 14 shows the operational efficiency of an organization in terms of workflow improvement. The data reveals that the overall mean is 4.23, interpreted as "Strongly Agree," indicating that the respondents strongly affirm that using software systems helps improve workflow across the different departments of an organization. The highest weighted mean is 4.28, with the statement "Workflows are more organized due to system use." This means that the overall organizational work processes have become more structured, well-coordinated, and easier to monitor through the use of software systems. Implementing an enterprise resource planning system into the organization's process enhances its inventory capabilities and cross-functional collaborations among different departments (Oliverio et al., 2023).

Financial Management Practices

Table 15. ACCURACY OF FINANCIAL RECORDS

	5 (Strongly Agree)	4 (Agree)	3 (Neither Agree nor Disagree)	2 (Disagree)	1 (Strongly Disagree)	Weighted Mean	Interpretation
Financial records are more accurate with software use.	134	202	40	3	3	4.21	**Strongly Agree**
System-generated financial data aids better decision-making.	173	143	57	5	4	4.25	**Strongly Agree**
There is a clear transaction history (e.g., who encoded and when).	151	165	56	8	2	4.19	**Agree**
Overall Mean						**4.21**	**Strongly Agree**

The data in Table No. 15 shows the influence of implementing a software system on an organization's financial management practices in terms of the accuracy of its financial records. The data reveal that the overall mean is 4.21, interpreted as "Strongly Agree," indicating that the respondents strongly affirm that using software systems greatly improves the accuracy of financial records. As businesses around the world strive to remain competitive, implementing software systems enables organizations to generate more accurate and reliable financial records, allowing business owners to use it as a basis for informed decisions (Santos, 2024).

Table 16. BUDGETING AND REPORTING

	5 (Strongly Agree)	4 (Agree)	3 (Neither Agree nor Disagree)	2 (Disagree)	1 (Strongly Disagree)	Weighted Mean	Interpretation
Budget preparation is more systematic.	163	150	58	6	5	4.20	**Agree**
Financial reporting is faster and more reliable.	132	191	51	6	2	4.16	**Agree**
Comparison of records has become easier (actual vs. budgeted).	168	145	59	6	4	4.22	**Strongly Agree**
Overall Mean						**4.20**	**Agree**

The data in Table No. 16 shows the influence of implementing a software system on an organization's financial management practices in terms of budgeting and reporting. The data reveals that the overall mean is 4.20, interpreted as "Agree," indicating that the respondents generally affirm that using software systems improves the budget preparation, financial reporting, and comparison of records. Although financial reporting had the lowest mean, the respondents interpreted it as "Agree," suggesting that software systems make the generation of reports faster and more efficient. However, some organizations may still experience challenges along the way and require continuous improvements. Mobara et al. (2025) mentioned in their article that

modern financial systems, such as enterprise resource planning and business intelligence software, have shortened the average budgetary preparations of an organization.

Table 17. COST CONTROL

	5 (Strongly Agree)	4 (Agree)	3 (Neither Agree nor Disagree)	2 (Disagree)	1 (Strongly Disagree)	Weighted Mean	Interpretation
Software helps improve overall cost control.	128	175	71	5	3	4.10	**Agree**
Clear track on how funds are being spent.	155	154	60	12	1	4.18	**Agree**
Reduce redundant or unnecessary expenses over time.	136	156	73	16	1	4.07	**Agree**
Overall Mean						**4.12**	**Agree**

The data in Table No. 17 shows the influence of implementing a software system towards an organization's financial management practices in terms of controlling costs. The data reveals that the overall mean is 4.12, interpreted as "Agree," indicating that the respondents generally affirm that using software systems improves the monitoring of the overall cost an organization may encounter.

Although the respondents gave a high rating to the statement that software systems provide a clear track on how funds are being spent, the rating for reducing redundant or unnecessary expenses was relatively lower, indicating that this area still requires further monitoring and improvement. The article of Mobara et al. (2025), found a 50.50 percent to 60.80 percent improvement in cost control after the implementation of accounting and financial software into the operations of different organizations.

Relationship Between Software System Implementation and Operational Efficiency

Table 18. RELATIONSHIP BETWEEN SOFTWARE SYSTEM IMPLEMENTATION AND OPERATIONAL EFFICIENCY

Variable Correlated	Pearson r	P-Value	Interpretation
Software System Implementation and Operational Efficiency	0.854	<0.001	Very Strong Positive Relationship

The data in Table No. 18 show the relationship between software system implementation and operational efficiency. The data reveal that the Pearson correlation coefficient is 0.854, which indicates a very strong positive relationship between the two variables. It is also stated that the p-value is less than 0.001, which is lower than the standard significance level of 0.05.

This means that there is a significant relationship between software system implementation and operational efficiency among MSMEs in the Tri-Cities of Cebu. This also translates that the higher the level of software system implementation, the higher the level of operational efficiency. Ajiga et al. (2024) mentioned in their article that by integrating software systems into an organization's operations, the company's operational efficiency increased significantly.

Operational Challenges Encountered During and After Software Implementation

Technical Challenges

Table 19. TECHNICAL CHALLENGES

	5 (Extremely High Barrier	4 (High Barrier)	3 (Moderate Barrier)	2 (Low Barrier)	1 (No Barrier)	Weighted Mean	Interpretation
Lack of technically skilled employees.	47	83	195	54	3	3.31	**Moderate Barrier**
Poor or unstable internet/network connection.	45	118	139	75	5	3.32	**Moderate Barrier**
Data privacy and security concerns.	44	91	180	62	5	3.28	**Moderate Barrier**
Lack of required hardware.	27	65	185	94	11	3.01	**Moderate Barrier**
Frequent system bugs or crashes.	57	93	174	48	10	3.36	**Moderate Barrier**
System cannot fully adapt to company processes.	36	89	176	76	5	3.20	**Moderate Barrier**
The system lacks scalability for increased usage.	30	78	201	66	7	3.15	**Moderate Barrier**
Overall Mean						**3.23**	**Moderate Barrier**

The data in Table No. 19 show the hindrances a business encounters in implementing a software system in terms of technical challenges. The data reveal that the overall mean is 3.23, interpreted as “Moderate Barrier,” indicating that the respondents generally perceive technical challenges as barriers that affect the implementation of software systems but remain manageable. This suggests that challenges such as system bugs or crashes and unstable internet connections can hinder the implementation process. However, these issues can still be addressed through appropriate technical support, system maintenance, and continuous improvements. The study of Rupeika-Apoga and Petrovska (2022) on barriers to sustainable digital transformation found out that the biggest barrier that an organization encounters while implementing a software system is IT-related security problems.

Cost Issues

Table 20. COST ISSUES

	5 (Extremely High Barrier	4 (High Barrier)	3 (Moderate Barrier)	2 (Low Barrier)	1 (No Barrier)	Weighted Mean	Interpretation
Insufficient budget for software	55	146	132	45	4	3.53	**High Barrier**

investment.							
High maintenance costs (subscription, upgrades, and network requirements).	47	175	112	42	6	3.56	**High Barrier**
The cost of additional hardware is burdensome.	52	141	131	52	6	3.47	**High Barrier**
Training and retraining costs are significant.	29	121	152	68	12	3.23	**Moderate Barrier**
Costs of customization, integration, and data migration are high.	55	149	121	50	7	3.51	**High Barrier**
Overall Mean						**3.46**	**High Barrier**

The data in Table No. 20 show the hindrances a business encounters in implementing a software system in terms of cost issues. The data reveal that the overall mean is 3.46, interpreted as "High Barrier," indicating that the respondents strongly perceive cost issues as barriers that affect the implementation of software systems. The highest-rated indicator is the high cost to maintain the software, such as system upgrades and infrastructures. These factors may discourage business owners from fully adopting a software system, especially those with limited financial resources. In the study of Zavodna et al. (2024), the researchers have found out that the cost of implementing and maintaining an artificial intelligence is high, making it one of the significant barriers to software implementation.

User Resistance

Table 21. USER RESISTANCE

	5 (Extremely High Barrier	4 (High Barrier)	3 (Moderate Barrier)	2 (Low Barrier)	1 (No Barrier)	Weighted Mean	Interpretation
Employees prefer manual processes over software.	26	91	195	54	16	3.15	**Moderate Barrier**
Employees fear job loss due to automation.	25	91	166	82	18	3.06	**Moderate Barrier**
Employees feel training is insufficient.	22	120	164	61	15	3.19	**Moderate Barrier**
Management provides limited support for implementation.	25	78	186	81	12	3.06	**Moderate Barrier**
System features are too complex for employees.	34	79	186	69	14	3.13	**Moderate Barrier**
Overall Mean						**3.12**	**Moderate Barrier**

The data in Table No. 21 show the hindrances a business encounters in implementing a software system in terms of user resistance. The data reveal that the overall mean is 3.12, interpreted as "Moderate Barrier," indicating that the respondents generally perceive user resistance as barriers that affect the implementation of software systems but remain manageable.

The most noticeable barrier affecting user acceptance is insufficient training. Employees may experience difficulty in navigating the system, which can result in hesitation or resistance during and after software system implementation. Implementing new software systems may require new skills that existing employees do not possess; thus, continuous employee training is a critical aspect that the management must consider (Ajiga et al., 2024).

Compatibility Problems

Table 22. COMPATIBILITY PROBLEMS

	5 (Extremely High Barrier	4 (High Barrier)	3 (Moderate Barrier)	2 (Low Barrier)	1 (No Barrier)	Weighted Mean	Interpretation
The software is incompatible with the hardware / operating system.	52	111	130	76	13	3.30	**Moderate Barrier**
Existing processes are difficult to convert into software systems.	67	120	108	77	10	3.41	**High Barrier**
New software cannot integrate well with existing systems.	38	122	135	73	14	3.25	**Moderate Barrier**
Software suppliers do not support integration.	65	131	102	68	16	3.42	**High Barrier**
Data migration from old to new systems is difficult.	85	99	127	66	5	3.51	**High Barrier**
Database incompatibility among various software providers.	34	111	148	79	10	3.21	**Moderate Barrier**
Overall Mean						**3.35**	**Moderate Barrier**

The data in Table No. 22 show the hindrances a business encounters in implementing a software system in terms of system compatibility issues. The data reveal that the overall mean is 3.35, interpreted as "Moderate Barrier," indicating that the respondents generally perceive system compatibility issues as barriers that affect the implementation of software systems but remain manageable.

Among the several indicators, the statement "Data migration from the old to the new system is difficult" gathered the highest weighted mean of 3.51. This means that transferring data from an old system to a new system remains the most significant challenge an organization may encounter.

The challenge may include data loss, duplication of records, and inconsistencies during the transition period. Ajiga et al. (2024), mentioned that old software systems may not fully support the new automation protocols and requirements, which causes difficulties and inaccuracies in data migration.

Thematic Analysis of Open-Ended Responses

Table 23. THEMATIC ANALYSIS OF OPEN-ENDED RESPONSES

Questions	Emerging Themes	Interpretation
How did you or your business come up with a decision to adopt or not adopt software systems in your operations?	• Growth of Business Improve operational efficiency • Reduce manual processes • Faster transactions • Better monitoring and reporting • Cost reduction • Some businesses are not yet ready to implement software systems.	The majority of the respondents implemented software systems to improve overall efficiency, automate routine tasks, reduce manual errors, and support business growth. A few businesses postponed adoption because of business size, cost considerations, or the nature of their operations.
What factor(s) do you believe indicate that a business is ready to implement software in its operations?	• Availability of budget • Increasing the volume of transactions • Support of the management • Readiness of employees • There is a clear business goal • There is a need for automation.	Organizational readiness has been viewed by the respondents as the primary requirement in having a successful software system implementation. They also emphasized the financial capability of the organization, management commitment, and the preparedness of its employees.
How did the software help in improving your business operations in terms of speed of processes, error reduction, operational workflow, or financial management?	•Processing of transactions becomes faster • There is a reduction in errors. • Better organizational workflow • Accuracy of report generation • Improved the overall financial management • Aided better decision-making	Implementing software systems was regarded as enhancing the overall operational efficiency of an organization.
What are the challenges or barriers you encountered during or after implementation?	• Limited user training • Employee / user resistance • Technical and internet connectivity issues • Implementation cost is high.	Employee resistance, technical limitations, and financial constraints are the most common challenges organizations may encounter upon implementation. However, despite these challenges being encountered, it can still be addressed through continuous support and training from the management.
In order for other MSMEs to achieve an effective software implementation, what suggestions can you give?	• Assess first the needs of the business • Choosing the most appropriate software system • Provide sufficient training to employees • There is a commitment from management upon implementing a software system. • Gradual and proper implementation planning and coordination across multiple departments	To ensure a successful software system implementation, respondents suggest that prior to everything, organizations need to carefully plan, select the suitable software system that can address their business requirements, and invest more in employee training.

What are your future plans for expanding or improving your software use?	• System integration and AI adoption • Software system upgrades • Employee development • Adoption of latest digital technologies	Most respondents intend to further expand software utilization through automation, integration, continuous improvement, and the adoption of emerging digital technologies.

The data in Table No. 23 show the thematic analysis result on how businesses view software implementation as an important tool for improving the overall operational efficiency, reducing manual processes, enhancing financial management, and eventually supporting the growth of the business. Despite the positive responses of the respondents, the respondents also identified several challenges, such as implementation cost, lack of user training, user resistance, technical issues, and internet connectivity problems. However, despite these challenges, most respondents expressed a positive outlook toward software adoption and recommended proper planning, employee training, management support, and gradual implementation to ensure successful software utilization.

CONCLUSION

Based on the findings of this research, it has been determined that implementing a software system is a key driver in enhancing the business operations of Micro, Small, and Medium Enterprises (MSMEs) in the Tri-Cities of Cebu. The study shows that by adopting software systems, it contributes to greater operational efficiency by enabling faster business processes, improving workflow management, and reducing human transactional errors. It also strengthens the financial management of a business by providing more accurate financial records, systematic budgeting and reporting, and better cost control. It also concluded that organizations with higher levels of software utilization are more likely to achieve better business performance. However, MSMEs still encounter challenges, such as high implementation cost, technical requirements, user resistance, and system compatibility. However, these challenges do not lessen the overall value that a software system can give, provided proper planning, organizational readiness, employee training, and the commitment of the management are intact. In other words, implementing software systems must be regarded as a strategic investment because it allows MSMEs in the Tri-Cities of Cebu to improve their overall operational productivity, optimize decision-making processes, enhance competitiveness among competitors, and allow sustainable long-term organizational growth.

Ethical Considerations

The study followed ethical research practices. Participation was voluntary, and respondents were informed of the purpose of the study. Informed consent was obtained before data collection. All information gathered was treated as confidential and used solely for academic purposes.

Conflict of Interest

The author declares that there is no conflict of interest regarding the conduct and publication of this study.

Data Availability

The data supporting the findings of this study are available from the corresponding author upon reasonable request, subject to confidentiality and data privacy considerations.

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